SECTION 16441
DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This section includes disconnect switches

B. Related Sections: The following sections contain requirements that relate to this section.
   1. Section 16196, Electrical Identification
   2. Section 16960, Electrical Testing

1.3 REFERENCES

A. National Electrical Manufacturer's Association (NEMA):
   1. NEMA KS 1-90, Enclosed Switches and Miscellaneous Distribution Equipment Switches (600 V maximum).

B. Underwriters Laboratories, Inc. (UL):
   1. UL 98-94, UL Standard for Safety Enclosed and Dead-Front Switches.
   2. UL 198E-88, UL Standard for Safety Class R Fuses.
   3. UL 512-93, UL Standard for Safety Fuseholders.

C. National Fire Protection Association (NFPA):
   1. NFPA 70, 1999, National Electrical Code (NEC) .

1.4 SUBMITTALS

A. Products furnished from listed manufacturers are pre-approved but still require submittal.

B. Submit proposed substitutions for approval in accordance with General and Supplementary Conditions.

1.5 QUALITY ASSURANCE

A. Ul and NEMA Compliance: Provide disconnect switches that are listed and labeled by UL and comply with applicable NEMA standards.

B. Comply with NFPA 70 for electrical components devices and accessories installation.

C. Coordination: Coordinate layout and installation of disconnect switches, with mechanical equipment, architectural equipment and with other equipment.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver equipment as factory-assembled units with protective packaging, crating, and covering.

B. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate size and location of structural-steel support members, channels, braces, backing and walls.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - DISCONNECT SWITCHES

A. General Electric.

B. Square D.

C. Cutler Hammer/Westinghouse.

D. Siemens.

2.2 DISCONNECT SWITCHES

A. General: Heavy-duty type, single throw, visible blades quick-make, quick-break, load interrupter enclosed knife switch with externally operable indicating handle interlocked to prevent opening front cover with switch in ON position; handle lockable in OFF position; ampere and voltage ratings, number of poles, fusible or nonfusible, as indicated; horsepower rating greater than motor horsepower when used on motor circuits.

B. Fusible Switch Assemblies: NEMA KS 1; UL 98.

C. Fuse Clips: UL 512; designed to accommodate Class R fuses.

D. Nonfusible Switch Assemblies: NEMA KS 1; Type HD, UL 98.

E. Auxiliary Switches: for all motors connected to variable frequency drives provide an auxiliary switch which will open prior to main contacts opening and will close after main contacts close and be directly connected to main operating handle.

F. Enclosures: NEMA 1 for indoor use and NEMA 3R for outdoor, use unless otherwise indicated.

2.3 ACCEPTABLE MANUFACTURERS - FUSES

A. Bussmann.

B. Gould-Shawmut.

C. Reliance.

2.4 FUSES

A. General: UL 198E; cartridge type, dual element.

B. Interrupting Rating: 200,000 RMS amperes.

C. 250-V Class: Bussmann FRN and LPN, Gould-Shawmut TR or AT-DE, and Reliance ECN or LEN.

D. 600-V Class: Bussmann FRS and LPS, Gould-Shawmut TRS or ATS-DE, and Reliance ECS and LES.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine rough-in for disconnect switches to determine if acceptable for equipment installation.

B. Examine walls and floors for suitable conditions where switches are to be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install disconnect switches where indicated.

B. Install fuses in fusible disconnect switches.

C. Identify disconnect switches in accordance with Section 16196.

3.3 FIELD QUALITY CONTROL

A. Verify disconnect switches and fuses meet requirements of Part 2.

B. Verify wiring connections are tight.

C. Verify switch mechanism is rigidly mounted within enclosure.

D. Verify switch operating lever is not binding and is free to move.

E. Verify insulating medium for isolating operating lever from energized switch contacts is firmly in place.

F. Verify proper phasing for motor loads.

G. With load connected, energize, observe load current and record same for submittal to the Construction Manager for approval.

3.4 ADJUSTING

A. Operate and adjust handles and doors. Replace damaged and malfunctioning switches.

3.5 CLEANING

A. Clean switch enclosures, inside and outside with manufacturers' recommended cleaning methods and materials.

3.6 PROTECTION

A. Provide protective covering for installed switches until end of project.

END OF SECTION 16441